USDA
NATURAL RESOURCES
CONSERVATION SERVICE
MARYLAND
CONSERVATION
PRACTICE STANDARD

WETLAND CREATION

CODE 658
(Reported by Acre)

DEFINITION

The creation of a wetland on a site which historically was not a wetland, or the rehabilitation of a drained or degraded wetland where the hydrology and plant community will be restored to conditions different from those which historically occurred.

PURPOSE

This practice may be applied for one or more of the following purposes:

- Create or enhance wildlife habitat;
- Provide offsite water quality benefits;
- Provide other natural wetland functions.

CONDITIONS WHERE PRACTICE APPLIES

This standard applies to creating wetlands on sites where no natural wetlands previously occurred. It also applies to restoring degraded wetlands to hydrologic and/or vegetative conditions different from those which were likely to have occurred naturally on the site.

This practice does not apply to:

- Sites where a wetland will be restored, as nearly as possible, to the original hydrologic conditions and plant communities which are likely to have existed before the wetland was modified. (Refer to the conservation practice standard for Wetland Restoration, Code 657.)
- Sites where a wetland will be constructed to treat significant point and non-point sources of water pollution. (Refer to the conservation practice standard for Constructed Wetland, Code 656.)

CONSIDERATIONS

- Consider the long-term land use objectives of the client. If the land user is interested in providing wildlife habitat, consider the wildlife species or groups of species to be supported and the habitat needs which can be met on the managed area.
- Consider the natural availability of plant species in the soil seed bank vs. the need for planting in the created wetland and upland buffer.
- Consider designing the site to maintain permanent or semi-permanent shallow surface water in at least 20% of the wetland. This will benefit resident wildlife such as waterfowl, wading birds, frogs, toads, salamanders, and turtles that need a long-term water supply.
- Consider the adverse impacts of nearby populations of nuisance wildlife such as muskrats, beavers, or resident geese, on the establishment and maintenance of the site. Also consider the potential for attracting nuisance wildlife into an area.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service

- Take note of other constraints such as economic feasibility, access, regulatory or program requirements, social effects, and visual aspects such as compatibility with the natural landscape.

- Consider long-term maintenance requirements of the created wetland.

Refer to Chapter 13 of the Engineering Field Handbook for further discussion of these planning considerations. Refer to the Maryland Wildlife Biology and Management Handbook for additional habitat considerations for wildlife species.

CRITERIA

Hydrology

On at least 70 percent of the wetland area, wetland hydrology (including natural microtopography of the soil surface in wetlands) shall be created or reestablished. The minimum hydrologic conditions of the created wetland shall meet current NRCS criteria for wetland hydrology. The depth, duration, and frequency of surface and/or ground water in the wetland shall be capable of supporting a prevalence of hydrophytic vegetation.

Up to 30 percent of the wetland area may be designed and maintained as shallow open water. The purpose of this modification shall be to support a diverse plant and animal community.

The size and character of the watershed above the site shall be assessed under present and future conditions in order to determine available hydrology.

A soils investigation shall be performed to determine conditions for minimizing seepage losses; suitability of materials for embankment construction; adequacy of subsurface water supply; and capability to support desired plant materials, as applicable.

Wetland hydrology may be provided by using a variety of measures, including but not limited to embankments, surface drain plugs, subsurface drain plugs, removal of fill material, and shallow excavation. These measures may not be needed on sites with degraded wetlands, where the natural hydrology has not been significantly modified.

Embankments – Small embankments may be used to impound water and provide wetland hydrology. Embankments which meet the definition and criteria for an embankment pond (as described in the conservation practice standard for Pond, Code 378) are not considered small embankments, and shall be designed according to the embankment criteria for Pond. Fills that will be entirely within a surface drainage ditch shall be designed according to the criteria for Surface Drain Plugs, as described in the conservation practice standard for Wetland Restoration, Code 657.

Small embankments shall have a minimum top width of 4 feet, and combined upstream and downstream side slopes of 6:1, with neither slope steeper than 2:1.

When needed to maintain the desired depth and duration of water on the site, appropriate measures shall be taken to minimize seepage losses through the embankment and subsoil.

Spillways - Spillways shall be provided for safe passage of water. Pipe conduits and vegetated spillways shall be designed according to the Engineering Field Handbook. Trash racks shall be required on inlets to pipe conduit spillways.

Spillway(s) shall be designed to pass the 10-year, 24-hour storm. A minimum of 0.5 foot of freeboard shall be provided above the 10-year flow depth. There shall be a minimum of 1 foot between the normal pool elevation and the top of the embankment

When there is no surface inflow entering the wetland from off-site (i.e., no drainage area), spillway(s) shall be designed to release the volume of the 10-year, 24-hour storm within an appropriate amount of time for management of the desired wetland plant community. The amount of time needed for release of excess water on a specific site shall be determined based on the depth of inundation and

the species of wetland plants desired on the site. A minimum of 0.5 foot of freeboard shall be provided above the 10-year rainfall depth.

Anti-seep collars shall be required around conduits 6 inches or larger in diameter being placed in earth fills over 2 feet high. The anti-seep collars shall have a minimum 1 foot projection around the pipe.

Other Structural Measures **-** Surface and subsurface drain plugs shall be designed according to criteria in the conservation practice standard for Wetland Restoration, Code 657.

Structural measures are not required on sites where the natural hydrology has not been significantly modified, and is sufficient to meet the intent of the practice and the needs of the land user.

Hydrophytic Vegetation

Hydrophytic vegetation shall be established in the created wetland, either naturally or by planting, or by a combination of these methods. On sites where seeds, rootstocks, and other propagules of desired species are already present in the soil or are likely to be transported to the site from nearby sources, natural regeneration shall be the preferred method of establishing the natural plant community. Planting shall be used as appropriate to hasten establishment of desired species or supplement the natural regeneration process. Refer to the conservation practice standard for Wetland Restoration, Code 657, for selected lists of wetland plant species.

At least 70 percent of the wetland area shall be designed to support a natural plant community which is typically found in a wetland in the same physiographic region and similar landscape position.

Up to 30 percent of the wetland area may be designed to provide shallow open water. The purpose of this modification shall be to support a diverse plant and animal community.

Wetland vegetation shall meet the following criteria for areal coverage and density, regardless of whether natural regeneration or planting is used: (1) Herbaceous vegetation shall be designed to achieve a minimum 85 percent areal cover of the desired herbaceous species after five years; (2) Woody vegetation shall be designed to achieve a minimum density of 200 trees per acre, 300 trees and shrubs per acre, or 400 shrubs per acre after five years.

Specific program requirements, especially concerning mitigation or restoration, may establish criteria different than those listed above.

Wetland Buffer **-** A buffer zone at least 35 feet wide shall be established around the site to protect the wetland. The buffer may consist of an existing, well-vegetated plant community comprised of perennial grasses, forbs, and/or woody species, or a plant community may need to be established either by natural regeneration or by planting. Selection of plant species to be established in the buffer shall be based on the planned functions of the buffer. Vegetative criteria in the conservation practice standards for Riparian Herbaceous Cover, Code 390, and Riparian Forest Buffer, Code 391, shall be used as appropriate.

For purposes of this standard, the buffer requirement does not apply to the portion of the site occupied by structural measures such as embankments or surface drain plugs.

SPECIFICATIONS

Plans and specifications for the development of a wetland site will be prepared in accordance with the previously listed design criteria. Plans and specifications will contain sufficient detail concerning hydrology, soils, and vegetation to ensure successful installation of the practice. Documentation will be in accordance with the section "Supporting Data and Documentation" in this standard.

Engineering and vegetative specifications as described in the conservation practice standard for Wetland Restoration, Code 657, shall be followed as appropriate.

OPERATION AND MAINTENANCE

An operation and maintenance plan will be prepared for each wetland creation site. At a minimum, the following components shall be addressed in the plan:

Structures

Describe what inspections are required to assess the integrity of the structure and determine whether it is functioning properly. Also describe the extent of vegetative management which will be needed on embankments and/or surface drain plugs.

Removal of Sediment and Other Repairs

Describe locations where sediment removal is acceptable (e.g., designed sediment basins, open water areas); conditions under which sediment may be removed and repairs made (e.g., time of year restrictions, permits needed, etc.).

Vegetation in the Wetland and Buffer Area

Describe what inspections are required to determine whether the desired vegetation is present in suitable quantity, quality, and distribution to meet objectives of the project. Describe the extent of management needed to maintain vegetation in the desired species composition or age class (if applicable), or no management required (e.g., natural area).

Nuisance Plants and Animals

Describe the extent to which plant and animal pest species, including noxious weeds, will need to be controlled.

Acceptable Uses

Describe the acceptable uses (e.g., timber production, grazing, hunting, nature preserve, etc.) and time of year/frequency of use restrictions, if any.

Frequency of Inspections

At a minimum, require annual inspections of structural and vegetative components.

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

Planning Information, Field Data, and Survey Notes

1. Field location of the project, acres, and assistance notes. Also note the location of the project on the conservation plan map.

2. Description of the objectives of the project, including the desired functions which the wetland is expected to provide.

3. Soil investigation logs and notes.

4. Inventory of existing vegetation on the site. If applicable and available, note the agrichemicals which have been used on the site during the past 5 years.

5. Topographic survey of the site, as appropriate for site conditions and the proposed design.

6. Description of existing drains and extent of existing blockage (if any).

Design Data

1. Hydrologic and hydraulic design computations.

2. Cross-section and profile of embankment.

3. Profile of vegetated spillway.

4. Elevation of conduit/riser pipe and/or tile inlet riser.

5. Planned blockage of drainage systems, including cross sections and lengths of drain plugs.

6. Plan view(s) to scale showing topographic contours, planting zones for vegetation, and locations of other features, as appropriate.

7. Seeding and/or planting requirements, including species selected for each planting zone, stocking/seeding rates, and type of planting stock to be used (e.g., bare-rooted seedlings, containerized stock, etc.).

8. Operation and maintenance plan.

Construction Check Data/As Built

1. Check notes recorded during or after completion of construction, and plans showing as-built conditions of all structures.

2. Note plant species as-installed, including species used, quantities, date(s) planted, and arrangement of plants within each planting zone.

3. Sign and date construction check notes and plans to include statement that practice meets or exceeds plans and specifications.

REFERENCES

1. Natural Resources Conservation Service, Conservation Practice Standard for Conservation Cover (Code 327).

2. Natural Resources Conservation Service, Conservation Practice Standard for Constructed Wetland (Code 656).

3. Natural Resources Conservation Service, Conservation Practice Standard for Critical Area Planting (Code 342).

4. Natural Resources Conservation Service, Conservation Practice Standard for Pond (Code 378)

5. Natural Resources Conservation Service, Conservation Practice Standard for Riparian Forest Buffer (Code 391).

6. Natural Resources Conservation Service, Conservation Practice Standard for Riparian Herbaceous Cover (Code 390).

7. Natural Resources Conservation Service, Conservation Practice Standard for Wetland Restoration (Code 657).

8. Natural Resources Conservation Service, Engineering Field Handbook, Chapter 6 "Structures," Chapter 11 "Ponds and Reservoirs," Chapter 13 "Wetland Restoration, Enhancement or Creation," and Chapter 14 "Drainage."

9. Natural Resources Conservation Service, Maryland Wildlife Biology and Management Handbook.

10. Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials.